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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,378	07/18/2003	Kunal Mukerjee	3382-64472	4367

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EXAMINER	
LEE, RICHARD J	
ART UNIT	PAPER NUMBER
2621	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
31 DAYS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/622,378	MUKERJEE ET AL.	
	Examiner	Art Unit	
	Richard Lee	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-73 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) 1-73 are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-17, drawn to a computer system, a method of processing images in a sequence of video images, comprising determining a fraction of a current image in the sequence, wherein the fraction represents an estimated temporal distance position for the current image relative to an interval between a first reference image for the current image and a second reference image for the current image, and processing the fraction along with a motion vector for the first reference image, classified in class 375, subclass 240.16.

II. Claims 18-23, drawn to a computer system, a method of encoding images in a sequence of video images, comprising determining a fraction for a current image in the sequence, wherein the current image has a previous reference image and a future reference image, selecting direct mode prediction for the current macroblock in the current image, finding a motion vector for a co-located macroblock in the future reference image, and scaling the motion vector for the co-located macroblock using the fraction, classified in class 375, subclass 240.24.

III. Claims 24-27, drawn to a computer system, a method of processing images in a sequence of images, comprising determining a temporal position of a current image in the sequence, where the temporal position is determined independent of time stamps, and processing current image based on the temporal position of the current image and a motion vector for the first at least one reference image, classified in class 375, subclass 240.28.

IV. Claims 28-35, drawn to a computer system a method of encoding a current image, comprising analyzing the at least two reference images along with the current image to determine whether the current image is to be predictively encoded based on the at least two reference images, based on the analyzing, encoding the current image independently from the at least two reference images, and assigning an image type to the current image, wherein the image type indicates that the current image is encoded independently from the at least two reference images, and a method of decoding a current image comprising receiving an image type for the current image, analyzing bit rate constraints for the decoding, and determining whether to omit the current image from the decoded video stream based on the analyzing and the image type for the current image, classified in class 375, subclass 240.25.

V. Claims 36-43, drawn to a computer system, a computer implemented method of processing video images, comprising processing a bit plane for a bi-directionally predicted video image, wherein the bit plane comprises binary information signifying whether macroblocks in the bi-directionally predicted video image are encoded using direct mode prediction or non-direct mode prediction, classified in class 375, subclass 240.15.

VI. Claims 44-48, drawn to a computer system, a method of processing images, comprising determining a value representing a forward motion vector component for a macroblock in the current image, determining a value representing a backward motion vector component for the macroblock in the current image,

adding the value representing the forward motion vector to a forward buffer, adding the value representing the backward motion vector to a backward buffer, and predicting motion vectors for other macroblocks in the current image using values in the forward buffer and values in the backward buffer, classified in class 375, subclass 240.12.

VII. Claims 49-57, drawn to a computer system, comprising selecting a motion vector resolution for the bi-directionally predicted image from among plural motion vector resolutions, wherein the plural motion vector resolutions include a half-pixel resolution and a quarter pixel resolution, selecting an interpolation filter for the bi-directionally predicted image from among plural interpolation filters, and encoding the bi-directionally predicted image using the selected motion vector resolution and the selected interpolation filter, classified in class 375, subclass 240.17.

VIII. Claims 58-65, drawn to a computer system, comprising monitoring bits used during the processing, based on the monitoring, determining whether to omit a current image having two reference images from the processed video image sequence, and wherein, at the time of the determining, a number of bits available for use in the processing is greater than or equal to the number of bits required to process the current image, classified in class 375, subclass 240.01.

IX. Claims 66-67, drawn to a computer system, comprising determining whether to omit a current image having two reference images from the processed video image sequence, if more than half of n images processed prior to the current

image were omitted from the processed video image sequence, then omitting the current image from the processed video sequence if the number of bits required to process the current image is greater than the average bits per image used to process the n images processed prior to the current image, and if half or less of the n images processed prior to the current image were omitted from the processed video image sequence, then omitting the current image from the processed video sequence if the number of bits required to process the current image is greater than the twice the average bits per image used to process the n images processed prior to the current image, classified in class 375, subclass 240.02.

X. Claims 68-73, drawn to a method of processing a video image sequence, comprising omitting a predicted image in the video image sequence from the encoded video image sequence, representing the omitted predicted image with a frame-level indicator in the bit stream, and wherein the frame-level indicator is operable to indicate the omitted predicted image to a video decoder, classified in class 375, subclass 240.14.

2. The inventions are distinct, each from the other because:

Inventions Groups I to X are each unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP э 806.04, MPEP э 808.01). In the instant case the different inventions are Groups I, II, III, IV, V, VI, VII, VIII, IX, and X. Group I involves a computer system, a method of processing images in a sequence of video images, comprising determining a fraction of a current image in the sequence, wherein the fraction represents an

estimated temporal distance position for the current image relative to an interval between a first reference image for the current image and a second reference image for the current image, and processing the fraction along with a motion vector for the first reference image. Group II involves a computer system, a method of encoding images in a sequence of video images, comprising determining a fraction for a current image in the sequence, wherein the current image has a previous reference image and a future reference image, selecting direct mode prediction for the current macroblock in the current image, finding a motion vector for a co-located macroblock in the future reference image, and scaling the motion vector for the co-located macroblock using the fraction. Group III involves a computer system, a method of processing images in a sequence of images, comprising determining a temporal position of a current image in the sequence, where the temporal position is determined independent of time stamps, and processing current image based on the temporal position of the current image and a motion vector for the first at least one reference image. Group IV involves a computer system a method of encoding a current image, comprising analyzing the at least two reference images along with the current image to determine whether the current image is to be predictively encoded based on the at least two reference images, based on the analyzing, encoding the current image independently from the at least two reference images, and assigning an image type to the current image, wherein the image type indicates that the current image is encoded independently from the at least two reference images, and a method of decoding a current image comprising receiving an image type for the current image, analyzing bit rate constraints for the decoding, and determining whether to omit the current image from the decoded video stream based on the analyzing and the image type for the current image. Group V involves a computer system, a computer implemented method of

processing video images, comprising processing a bit plane for a bi-directionally predicted video image, wherein the bit plane comprises binary information signifying whether macroblocks in the bi-directionally predicted video image are encoded using direct mode prediction or non-direct mode prediction. Group VI involves a computer system, a method of processing images, comprising determining a value representing a forward motion vector component for a macroblock in the current image, determining a value representing a backward motion vector component for the macroblock in the current image, adding the value representing the forward motion vector to a forward buffer, adding the value representing the backward motion vector to a backward buffer, and predicting motion vectors for other macroblocks in the current image using values in the forward buffer and values in the backward buffer. Group VII involves a computer system, comprising selecting a motion vector resolution for the bi-directionally predicted image from among plural motion vector resolutions, wherein the plural motion vector resolutions include a half-pixel resolution and a quarter pixel resolution, selecting an interpolation filter for the bi-directionally predicted image from among plural interpolation filters, and encoding the bi-directionally predicted image using the selected motion vector resolution and the selected interpolation filter. Group VIII involves a computer system, comprising monitoring bits used during the processing, based on the monitoring, determining whether to omit a current image having two reference images from the processed video image sequence, and wherein, at the time of the determining, a number of bits available for use in the processing is greater than or equal to the number of bits required to process the current image. Group IX involves a computer system, comprising determining whether to omit a current image having two reference images from the processed video image sequence, if more than half of n images processed prior to the current

image were omitted from the processed video image sequence, then omitting the current image from the processed video sequence if the number of bits required to process the current image is greater than the average bits per image used to process the n images processed prior to the current image, and if half or less of the n images processed prior to the current image were omitted from the processed video image sequence, then omitting the current image from the processed video sequence if the number of bits required to process the current image is greater than the twice the average bits per image used to process the n images processed prior to the current image. Group X involves a method of processing a video image sequence, comprising omitting a predicted image in the video image sequence from the encoded video image sequence, representing the omitted predicted image with a frame-level indicator in the bit stream, and wherein the frame-level indicator is operable to indicate the omitted predicted image to a video decoder. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Groups II-X, for example, restriction for examination purposes as indicated is proper.

4. Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and

specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Lee whose telephone number is (571) 272-7333. The Examiner can normally be reached on Monday to Friday from 8:00 a.m. to 5:30 p.m, with alternate Fridays off.

RICHARD LEE
PRIMARY EXAMINER

Richard Lee/rl

12/22/06